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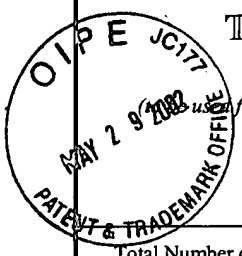

TRANSMITTAL FORM

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Filing Date	July 31, 2001
First Named Inventor	Shunpei YAMAZAKI et al.
Group Art Unit	2811
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ENCLOSURES *(check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment / Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
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- ☒ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Response to Missing Parts/ Incomplete Application
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- ☒ Request for Interference Under 37 C.F.R. 1.607

Remarks

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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Jeffrey L. Costellia – Reg. No. 35,483 Nixon Peabody LLP 8180 Greensboro Drive Suite 800 McLean, VA 22102
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Date	May 29, 2002

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#5 6-25-02 Mollusk

Docket No. 740756-2345

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:	)	
Shunpei YAMAZAKI et al.	)	Group Art Unit: 2811
Serial No. 09/917,633	)	
Filed: July 31, 2001	)	
For: Semiconductor Device and Method of Fabricating the Same	)	

Request for Interference Under 37 C.F.R. 1.607

Commissioner for Patents
Washington, D.C. 20231

Sir:

Applicant hereby requests the declaration of an interference between the present application and U.S. Patent No. 6,097,037 ('037).

Interference (OCAS)

37 C.F.R. 1.608 form PTO-850 form 1.193(b) form

1) Identification of Patent

U.S. Patent No. 6,097,037 ("the '037 patent").

2) Priority

Applicants' application is entitled to priority based upon Japanese Application No. 5-48534 which was filed on February 15, 1993. Thus, Applicant's application priority predates the earliest priority date of November 12, 1997 for the '037 patent.

3) Presentation of Proposed Count

Applicants hereby propose either of the two following counts. The Applicants defer to the judgment of the Examiner as to which of the following options should be declared the count.

Option A is identical to claim 1 of the '037 patent and corresponds to claim 12 of the present application. Option B is identical to claim 1 of the present application and corresponds to claim 1 of the '037 patent.

Option A:

A transistor comprising:

an MILC (metal-induced lateral crystallization) region formed on a substrate with a semiconductor material and including a channel region; and

a plurality of MIC (metal-induced crystallization) regions formed on sides of the MILC region with a semiconductor material, wherein at least one boundary between the MILC region and one of the MIC regions is located outside the channel region.

Option B:

A transistor comprising:

a metal advanced lateral crystallization region formed on a substrate with a semiconductor material and including a channel region; and

a plurality of metal advanced crystallization regions formed on sides of the metal advanced lateral crystallization region with a semiconductor material, wherein at least one boundary between the metal advanced lateral crystallization region and one of the metal advanced crystallization regions is located outside the channel region.

4) Identification of Claim in the Patent corresponding to the Proposed Count

At least Claim 1 of the '037 Patent corresponds to the proposed counts, since it corresponds exactly to Proposed count Option A and corresponds substantially to Proposed count Option B. The remaining claims 2-16 should also be considered corresponding to both of the proposed counts because they relate to the same patentable invention. Specifically, claims 2-7 of

the instant application relate substantially to claims 2 and 5-9 of the '037 Patent. Claim 8 relates to claim 11 of the '037 Patent, claim 9 relates to claim 14 of the '037 Patent. Claim 10 relates to claim 1 of the '037 Patent, claim 11 relates to claim 7 of the '037 Patent, and claims 12 and 13 are identical to claims 1 and 7 of the '037 Patent. The remaining claims 3, 4, 10, 12, 13, 15, and 16 of the '037 Patent should likewise be considered corresponding to the count because they relate to the same patentable invention.

5) Identification of Application Claim corresponding to the Proposed Count

Claim 12 of the application corresponds exactly to Count Option A:

A transistor comprising:

an metal-induced lateral crystallization region formed on a substrate with a semiconductor material and including a channel region; and

a plurality of metal-induced crystallization regions formed on sides of the metal-induced lateral crystallization region with a semiconductor material, wherein at least one boundary between the metal-induced lateral crystallization region and one of the metal-induced crystallization regions is located outside the channel region.

Claim 1 of the application corresponds substantially to Count Option B:

A transistor comprising:

a metal advanced lateral crystallization region formed on a substrate with a semiconductor material and including a channel region; and

a plurality of metal advanced crystallization regions formed on sides of the metal advanced lateral crystallization region with a semiconductor material, wherein at least one boundary between the metal advanced lateral crystallization region and one of the metal advanced crystallization regions is located outside the channel region.

For the reasons advanced above, the remaining claims of the instant application should likewise be considered corresponding to the count.

6) Application of terms of claims not previously in the application to the disclosure of the application.

The terms "metal-induced crystallization" and "metal-induced lateral crystallization" are not found exactly within the disclosure of the application. However, support for such terms are found in the specification. A claim chart providing a detailed analysis showing where support for the claims of the application may be found in the specification is attached as Appendix B.

The '037 patent describes a metal-induced crystallization process as a "method of crystallizing amorphous silicon using heat treatment at a low temperature after a certain kind of a metal layer has been deposited on the amorphous silicon." The metal-induced crystallization process "is beneficial due to the low temperature crystallization of amorphous silicon."

The specification of the present application describes the same process as a "method of growing a crystal of silicon film epitaxially in solid phase centering on a crystalline island film as a nucleus or as a seed crystal" (page 2, lines 18-20) using a metal such as nickel silicide (page 2, line 30) so that "the crystal growing temperature could be lowered by 20 C to 150 C compared to that of the conventional method" (page 3, lines 2-4). Thus, the nucleus or seed crystal provided by the metal "induces" crystallization at the lower temperatures. Therefore, the specification of the present application provides support for "metal-induced crystallization."

The '037 patent describes a metal-induced lateral crystallization process as a region that "has no seed of crystallization" but that "lateral crystallization is performed by the MIC regions" (col. 1, lines 50-52) wherein "crystallization by the nickel silicide 14 is induced in the lateral direction of the MIC region" (col. 1, lines 54-55).

Again, the specification of the current application provides support for metal-induced lateral crystallization as a process in which "the region of crystal silicon is expanded away therefrom as the starting point" (page 3, lines 17-18). The specification describes this process in detail at, for example, page 9, lines 15-17, as: "the crystal growth advances from both ends of the

island semiconductor region and finishes around the middle thereof" in reference to a second exemplary embodiment of the invention. Therefore, the specification of the present application provides support for "metal-induced crystallization." Applicant respectfully submits that all remaining terms in the application claims which correspond to the count are in the original disclosure of the application.

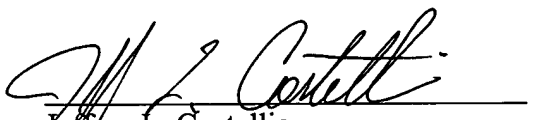
On the attached sheets, Appendix A is the '037 patent with which the Applicants intend to provoke an interference. Appendix B is a claim chart demonstrating where support for the claims of the present application may be found in the specification.

7) Benefit of Foreign Filed Priority Application

Applicants are also entitled to foreign priority of Japanese Application No. 5-48534. Appendix C is a copy of the English translation of the Japanese priority document. Appendix D is a claim chart demonstrating where support for the claims of the application may be found in the Japanese priority document. Consequently, the effective filing date for the instant application should be February 15, 1993.

In view of the foregoing, Applicants request the declaration of an interference between the instant application and the '037 patent.

Respectfully submitted,



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Claim Language	Support in Priority Document
1. A transistor comprising:	"The present invention relates to a method of obtaining a crystalline semiconductor used for thin film devices such as a thin film insulated gate type field effect transistor (thin film transistor or TFT)." Page 2, paragraph 0001
a metal advanced lateral crystallization region	"forming regions containing at least one of nickel, iron, cobalt, platinum or paladium so that they adhere on part of the impurity regions, and by annealing the whole to crystallize it starting from the region containing nickel." Page 3, paragraph 0004. "advancing the crystallization of the source and drain at the same time as the crystallization of the active layer (channel forming region)." Page 3, paragraph 0004. "The crystal silicon which expands thus from a specific location has a structure close to a monocrystal having good continuous crystallinity." Page 3, paragraph 0008. "According to the present invention, a film or the like containing a simple substance of nickel, iron, cobalt, platinum or their silicides is adhered to the impurity regions of the thin film transistor, and the region of the crystal silicon is expanded away therefrom as the starting point." Page 4, paragraph 0007. "The crystal silicon which thus expands from a specific location." Page 4, paragraph 0008. "At this time, the crystal growth advances . . In this case, crystallization advances . ." Page 7, paragraph 0017.
formed on a substrate	"formed on a substrate" Page 5, paragraph 0010.
with a semiconductor material	"semiconductor material" Page 4, paragraph 0009.
and including a channel region; and	"channel forming region" Page 4, paragraph 0017.
a plurality of metal advanced crystallization regions formed on sides of the metal advanced lateral crystallization region with a semiconductor material,	"[H]oles were created on the silicon oxide film 13 on the impurity regions to form nickel silicide (or nickel) films 17A and 17B . . Then annealing was carried out . . to crystallize the impurity regions 16 and other semiconductor regions." Page 6, paragraph 0012.
wherein at least one boundary between the metal advanced lateral crystallization region and one of the metal advanced crystallization	"In particular, the present invention allows substantial elimination of the grain boundary between the source and drain and the active

regions is located outside the channel region.	layer" Page 3, paragraph 0004.
2. The transistor according to claim 1, wherein the metal advanced lateral crystallization region	See Claim 1 above.
include (sic) impurity doped regions	"Next, an impurity was introduced . . . Impurity regions 16A and 16B were thus formed. Page 6, paragraph 0012.
formed on sides of the channel region.	"[H]oles were created on the silicon oxide film 13 on the impurity regions to form nickel silicide (or nickel) films 17A and 17B . . Then annealing was carried out . . to crystallize the impurity regions 16 and other semiconductor regions." Page 6, paragraph 0012.
3. The transistor of claim 1, wherein the metal advanced lateral crystallization region	See Claim 1.
includes source and drain regions.	"advancing the crystallization of the source and drain at the same time." Page 3, paragraph 0004.
4. The transistor of claim 1, wherein the metal advanced lateral crystallization region includes no dopant portions formed on sides of the channel region.	"the impurity regions and the gate electrode were offset as seen in the figure." Page 6, paragraph 0012.
5. A transistor comprising:	"The present invention relates to a method of obtaining a crystalline semiconductor used for thin film devices such as a thin film insulated gate type field effect transistor (thin film transistor or TFT)." Page 2, paragraph 0001
a channel region;	"channel forming region" Page 4, paragraph 0017.
a source region	"advancing the crystallization of the source and drain at the same time." Page 3, paragraph 0004.
having a first source portion adjacent to the channel region and a second source portion adjacent to the first source portion;	"[A] film or the like containing a simple substance of nickel . . . is adhered to the impurity regions . . . and the region of the crystal silicon is expanded away therefrom as a starting point." Page 4, paragraph 0007. As shown in Fig. 1B, the nickel silicide films 17A and 17B only cover the outer portion of the impurity regions 16A and 16B. "crystal growth advances from both ends of the island-like semiconductor region and finishes around the middle thereof. Accordingly, no grain boundary was produced in the channel forming region." Page 7, paragraph 0017. Thus, any "grain boundary" exists in the source portion

	and defines the first source portion and the second source portion.
and a drain region having a first drain portion adjacent to the channel region and a second drain portion adjacent to the first drain portion;	"[A] film or the like containing a simple substance of nickel . . . is adhered to the impurity regions . . . and the region of the crystal silicon is expanded away therefrom as a starting point." Page 4, paragraph 0007. As shown in Fig. 1B, the nickel silicide films 17A and 17B only cover the outer portion of the impurity regions 16A and 16B. "crystal growth advances from both ends of the island-like semiconductor region and finishes around the middle thereof. Accordingly, no grain boundary was produced in the channel forming region." Page 7, paragraph 0017. Thus, any "grain boundary" exists in the drain portion and defines the first drain portion and the second drain portion.
wherein the channel region and at least one of the first source portion and the first drain portion comprise a metal advanced lateral crystallization region.	"The present invention allows substantial elimination of the grain boundary between the source and drain and the active layer and to obtain a good characteristic by advancing the crystallization of the source and drain at the same time as the crystallization of the active layer (channel forming region)." Page 3, paragraph 0004.
6. The transistor of claim 5, wherein the second source portion comprises a metal advanced crystallization region.	The source portions are "crystallize[d] starting from the region containing nickel." Page 3, paragraph 0004. The specification explains that crystals grow centering on nickel silicide seeds. "nickel (Ni), cobalt, iron and platinum are readily coupled with silicon and that the crystal would grow centering on them . . a method of growing a silicon crystal centering on the nickel silicide." Page 4, paragraph 0006. "the region of the crystal silicon is expanded away therefrom as the starting point." Page 4, paragraph 0007. As shown in Fig. 1B, the nickel silicide films 17A and 17B form the seeds from which the silicon crystal grows. Thus, the metal advanced crystallization region is below the area of the impurity regions 16A and 16B directly below the nickel silicide films 17A and 17B.
7. The transistor of claim 5, wherein the second drain portion comprises a metal	The source portions are "crystallize[d] starting from the region containing nickel." Page 3,

advanced crystallization region.	paragraph 0004. The specification explains that crystals grow centering on nickel silicide seeds. "nickel (Ni), cobalt, iron and platinum are readily coupled with silicon and that the crystal would grow centering on them . . a method of growing a silicon crystal centering on the nickel silicide." Page 4, paragraph 0006. "the region of the crystal silicon is expanded away therefrom as the starting point." Page 4, paragraph 0007. As shown in Fig. 1B, the nickel silicide films 17A and 17B form the seeds from which the silicon crystal grows. Thus, the metal advanced crystallization region is below the area of the impurity regions 16A and 16B directly below the nickel silicide films 17A and 17B.
8. The transistor of claim 5, wherein the source and drain regions are impurity doped.	"Next, an impurity was introduced . . . Impurity regions 16A and 16B were thus formed. Page 6, paragraph 0012.
9. The transistor of claim 5, wherein the channel region, the first source portion and the first drain portion comprise the metal advanced lateral crystallization region,	"The present invention allows substantial elimination of the grain boundary between the source and drain and the active layer and to obtain a good characteristic by advancing the crystallization of the source and drain at the same time as the crystallization of the active layer (channel forming region)." Page 3, paragraph 0004.
the second source region comprises a metal advanced crystallization region,	The source portions are "crystallize[d] starting from the region containing nickel." Page 3, paragraph 0004. The specification explains that crystals grow centering on nickel silicide seeds. "nickel (Ni), cobalt, iron and platinum are readily coupled with silicon and that the crystal would grow centering on them . . a method of growing a silicon crystal centering on the nickel silicide." Page 4, paragraph 0006. "the region of the crystal silicon is expanded away therefrom as the starting point." Page 4, paragraph 0007. As shown in Fig. 1B, the nickel silicide films 17A and 17B form the seeds from which the silicon crystal grows. Thus, the metal advanced crystallization region is below the area of the impurity regions 16A and 16B directly below the nickel silicide films 17A and 17B.
and the second drain region comprises a metal	The source portions are "crystallize[d] starting

advanced crystallization region.	from the region containing nickel." Page 3, paragraph 0004. The specification explains that crystals grow centering on nickel silicide seeds. "nickel (Ni), cobalt, iron and platinum are readily coupled with silicon and that the crystal would grow centering on them . . a method of growing a silicon crystal centering on the nickel silicide." Page 4, paragraph 0006. "the region of the crystal silicon is expanded away therefrom as the starting point." Page 4, paragraph 0007. As shown in Fig. 1B, the nickel silicide films 17A and 17B form the seeds from which the silicon crystal grows. Thus, the metal advanced crystallization region is below the area of the impurity regions 16A and 16B directly below the nickel silicide films 17A and 17B.
10. A transistor comprising:	"The present invention relates to a method of obtaining a crystalline semiconductor used for thin film devices such as a thin film insulated gate type field effect transistor (thin film transistor or TFT)." Page 2, paragraph 0001
a metal advanced lateral crystallization region	"forming regions containing at least one of nickel, iron, cobalt, platinum or paladium so that they adhere on part of the impurity regions, and by annealing the whole to crystallize it starting from the region containing nickel." Page 3, paragraph 0004. "advancing the crystallization of the source and drain at the same time as the crystallization of the active layer (channel forming region)." Page 3, paragraph 0004. "The crystal silicon which expands thus from a specific location has a structure close to a monocrystal having good continuous crystallinity." Page 3, paragraph 0008. "According to the present invention, a film or the like containing a simple substance of nickel, iron, cobalt, platinum or their silicides is adhered to the impurity regions of the thin film transistor, and the region of the crystal silicon is expanded away therefrom as the starting point." Page 4, paragraph 0007. "The crystal silicon which thus expands from a specific location." Page 4, paragraph 0008. "At this time, the crystal growth advances . . In this case, crystallization

	advances . ." Page 7, paragraph 0017.
formed on a substrate	"formed on a substrate" Page 5, paragraph 0010.
with a semiconductor material	"semiconductor material" Page 4, paragraph 0009.
and including a channel region; and	"channel forming region" Page 4, paragraph 0017.
a plurality of metal advanced crystallization regions formed on sides of the metal advanced lateral crystallization region with a semiconductor material,	"[H]oles were created on the silicon oxide film 13 on the impurity regions to form nickel silicide (or nickel) films 17A and 17B . . Then annealing was carried out . . to crystallize the impurity regions 16 and other semiconductor regions." Page 6, paragraph 0012.
wherein at least one portion between the metal advanced lateral crystallization region and one of the metal advanced crystallization regions is located outside the channel region.	"In particular, the present invention allows substantial elimination of the grain boundary between the source and drain and the active layer" Page 3, paragraph 0004.
11. A transistor comprising:	"The present invention relates to a method of obtaining a crystalline semiconductor used for thin film devices such as a thin film insulated gate type field effect transistor (thin film transistor or TFT)." Page 2, paragraph 0001
a channel region;	"channel forming region" Page 4, paragraph 0017.
a source region	"advancing the crystallization of the source and drain at the same time." Page 3, paragraph 0004.
having a source portion adjacent to the channel region; and	"[A] film or the like containing a simple substance of nickel . . . is adhered to the impurity regions . . . and the region of the crystal silicon is expanded away therefrom as a starting point." Page 4, paragraph 0007. As shown in Fig. 1B, the nickel silicide films 17A and 17B only cover the outer portion of the impurity regions 16A and 16B. "crystal growth advances from both ends of the island-like semiconductor region and finishes around the middle thereof. Accordingly, no grain boundary was produced in the channel forming region." Page 7, paragraph 0017. Thus, any "grain boundary" exists in the source portion and defines the first source portion and the second source portion.
a drain region having a drain portion adjacent to the channel region;	"[A] film or the like containing a simple substance of nickel . . . is adhered to the impurity regions . . . and the region of the

	crystal silicon is expanded away therefrom as a starting point." Page 4, paragraph 0007. As shown in Fig. 1B, the nickel silicide films 17A and 17B only cover the outer portion of the impurity regions 16A and 16B. "crystal growth advances from both ends of the island-like semiconductor region and finishes around the middle thereof. Accordingly, no grain boundary was produced in the channel forming region." Page 7, paragraph 0017. Thus, any "grain boundary" exists in the drain portion and defines the first drain portion and the second drain portion.
wherein the channel region and at least one of the source portion and the drain portion comprise a metal advanced lateral crystallization region.	"The present invention allows substantial elimination of the grain boundary between the source and drain and the active layer and to obtain a good characteristic by advancing the crystallization of the source and drain at the same time as the crystallization of the active layer (channel forming region)." Page 3, paragraph 0004.
12. A transistor comprising:	"The present invention relates to a method of obtaining a crystalline semiconductor used for thin film devices such as a thin film insulated gate type field effect transistor (thin film transistor or TFT)." Page 2, paragraph 0001.
a metal-induced lateral crystallization region	"forming regions containing at least one of nickel, iron, cobalt, platinum or paladium so that they adhere on part of the impurity regions, and by annealing the whole to crystallize it starting from the region containing nickel." Page 3, paragraph 0004. "advancing the crystallization of the source and drain at the same time as the crystallization of the active layer (channel forming region)." Page 3, paragraph 0004. "The crystal silicon which expands thus from a specific location has a structure close to a monocrystal having good continuous crystallinity." Page 3, paragraph 0008. "According to the present invention, a film or the like containing a simple substance of nickel, iron, cobalt, platinum or their silicides is adhered to the impurity regions of the thin film transistor, and the region of the crystal silicon is expanded away therefrom as the starting point." Page 4,

	paragraph 0007. "The crystal silicon which thus expands from a specific location." Page 4, paragraph 0008. "At this time, the crystal growth advances . . In this case, crystallization advances . ." Page 7, paragraph 0017.
formed on a substrate	"formed on a substrate" Page 5, paragraph 0010.
with a semiconductor material	"semiconductor material" Page 4, paragraph 0009.
and including a channel region; and	"channel forming region" Page 4, paragraph 0017.
a plurality of metal-induced crystallization regions formed on sides of the metal induced lateral crystallization region with a semiconductor material,	"[H]oles were created on the silicon oxide film 13 on the impurity regions to form nickel silicide (or nickel) films 17A and 17B . . Then annealing was carried out . . to crystallize the impurity regions 16 and other semiconductor regions." Page 6, paragraph 0012.
wherein at least one boundary between the metal induced lateral crystallization region and one of the metal induced crystallization regions is located outside the channel region.	"In particular, the present invention allows substantial elimination of the grain boundary between the source and drain and the active layer" Page 3, paragraph 0004.
13. A transistor comprising:	"The present invention relates to a method of obtaining a crystalline semiconductor used for thin film devices such as a thin film insulated gate type field effect transistor (thin film transistor or TFT)." Page 2, paragraph 0001.
a channel region;	"channel forming region" Page 4, paragraph 0017.
a source region	"advancing the crystallization of the source and drain at the same time." Page 3, paragraph 0004.
having a first source portion adjacent to the channel region and a second source portion adjacent to the first source portion; and	"[A] film or the like containing a simple substance of nickel . . . is adhered to the impurity regions . . . and the region of the crystal silicon is expanded away therefrom as a starting point." Page 4, paragraph 0007. As shown in Fig. 1B, the nickel silicide films 17A and 17B only cover the outer portion of the impurity regions 16A and 16B. "crystal growth advances from both ends of the island-like semiconductor region and finishes around the middle thereof. Accordingly, no grain boundary was produced in the channel forming region." Page 7, paragraph 0017. Thus, any "grain boundary" exists in the source portion and defines the first source portion and the

	second source portion.
a drain region having a first drain portion adjacent to the channel region and a second drain portion adjacent to the first drain portion;	"[A] film or the like containing a simple substance of nickel . . . is adhered to the impurity regions . . . and the region of the crystal silicon is expanded away therefrom as a starting point." Page 4, paragraph 0007. As shown in Fig. 1B, the nickel silicide films 17A and 17B only cover the outer portion of the impurity regions 16A and 16B. "crystal growth advances from both ends of the island-like semiconductor region and finishes around the middle thereof. Accordingly, no grain boundary was produced in the channel forming region." Page 7, paragraph 0017. Thus, any "grain boundary" exists in the drain portion and defines the first drain portion and the second drain portion.
wherein the channel region and at least one of the first source portion and the first drain portion comprise a metal induced lateral crystallization region.	"The present invention allows substantial elimination of the grain boundary between the source and drain and the active layer and to obtain a good characteristic by advancing the crystallization of the source and drain at the same time as the crystallization of the active layer (channel forming region)." Page 3, paragraph 0004.

Claim Language	Support in Pending Application
1. A transistor comprising:	The present invention relates to a method of obtaining... (thin film transistor or TFT) (page 1, lines 5-8); The TFT . . .was fabricated through the process described above. (page 7, line 32 – page 8, line 1)
a metal advanced lateral crystallization region	"forming regions containing at least one of nickel,... so that they adhere on part of the impurity regions, and by annealing the whole to crystallize it starting from the region containing nickel" (page 2, lines 8-11). "advancing the crystallization of the source and drain at the same time as the crystallization of the active layer (channel forming region)." (page 2, lines 15-17). "The crystal silicon which expands thus from a specific location has a structure close to a monocrystal having good continuous crystallinity." (page 3, lines 23-25). "[T]he crystal grew in the horizontal direction from the region into which nickel was introduced (the region contacting with an oxide film 51) to the region into which no nickel was introduced." (page 14, line 30 – page 15, line 1). "[C]rystal growth in the horizontal direction." (page 18, line 3). "[T]he present invention allows control of the direction of crystal growth." (page 18, lines 7-8). "[T]he crystals are grown in the transverse direction with the surface of the substrate" (page 24, lines 2-3).
formed on a substrate	substrate . . . 10 (page 6, line 11).
with a semiconductor material	title; "an amorphous silicon film" (page 6, line 12)
and including a channel region; and	"channel forming region (the semiconductor region under the gate) electrode" (page 8, lines 8-9) (Fig. 1)
a plurality of metal advanced crystallization regions formed on sides of the metal advanced lateral crystallization region with a semiconductor material,	"[H]oles were created on the silicon oxide file 13 on the impurity regions to form nickel silicide (or nickel) films 17A and 17B . . . Then annealing was carried out . . to crystallize the impurity regions 16 and other semiconductor regions." (Fig. 1; page 7 lines 16-22).
wherein at least one boundary between the metal advanced lateral crystallization region and one of the metal advanced crystallization regions is located outside the channel region.	"[T]he present invention allows substantial elimination of the grain boundary between the source and drain and the active layer... by advancing the crystallization of the source and

	drain at the same time as crystallization of the active layer (channel forming region)." (page 2, lines 12-17); "According to the present invention,... the region of the crystal silicon is expanded away therefrom as the starting point." (page 3, lines 13-18); "crystal growth advances from both ends of the island semiconductor region and finishes around the middle thereof. Accordingly, no grain boundary was produced in the channel forming region" (page 9, lines 15-19; Fig. 1 and 2(b)).
2. The transistor according to claim 1, wherein the metal advanced lateral crystallization region	Claim 1.
include (sic) impurity doped regions	[A]n impurity was introduced by a plasma doping method. . . . Impurity regions 16A and 16B were thus formed. (page 7, lines 10-15, Figure 1B).
formed on sides of the channel region.	"[H]oles were created on the silicon oxide file 13 on the impurity regions to form nickel silicide (or nickel) films 17A and 17B . . . Then annealing was carried out . . to crystallize the impurity regions 16 and other semiconductor regions." (Fig. 1; page 7 lines 16-22).
3. The transistor of claim 1, wherein the metal advanced lateral crystallization region	Claim 1.
includes source and drain regions.	"advancing the crystallization of the source and drain at the same time as the crystallization of the active layer (channel forming region)." (page 2, lines 15-17.)
4. The transistor of claim 1, wherein the metal advanced lateral crystallization region includes no dopant portions formed on sides of the channel region.	"The impurity regions and the gate electrode were offset as seen in the figure." (page 7, lines 15-16; Figures 1B; 3B; 3C; 4)
5. A transistor comprising:	The present invention relates to a method of obtaining... (thin film transistor or TFT) (page 1, lines 5-8); The TFT . . .was fabricated through the process described above. (page 7, line 32 – page 8, line 1)
a channel region;	"channel forming region (the semiconductor region under the gate) electrode" (page 8, lines 8-9) (Fig. 1)
a source region	"the source" (page 8, line 7).
having a first source portion adjacent to the channel region and a second source portion adjacent to the first source portion;	"[A] film or the like containing a simple substance of nickel . . .is adhered to the impurity regions . . . and the region of the

	crystal silicon is expanded away therefrom as the starting point." (page 3, lines 13-18). As shown in Fig. 1B, the nickel silicide films 17A and 17B only cover the outer portion of the impurity regions 16A and 16B. "crystal growth advances from both ends of the island semiconductor region and finishes around the middle thereof. Accordingly, no grain boundary was produced in the channel forming region" (page 9, lines 15-19; Fig. 1 and 2(b)). Thus, any "grain boundary" exists in the source portion and defines the first source portion and the second source portion.
and a drain region having a first drain portion adjacent to the channel region and a second drain portion adjacent to the first drain portion;	"[A] film or the like containing a simple substance of nickel . . .is adhered to the impurity regions . . . and the region of the crystal silicon is expanded away therefrom as the starting point." (page 3, lines 13-18). As shown in Fig. 1B, the nickel silicide films 17A and 17B only cover the outer portion of the impurity regions 16A and 16B. "crystal growth advances from both ends of the island semiconductor region and finishes around the middle thereof. Accordingly, no grain boundary was produced in the channel forming region" (page 9, lines 15-19; Fig. 1 and 2(b)). Thus, any "grain boundary" exists in the drain portion and defines the first drain portion and the second drain portion.
wherein the channel region and at least one of the first source portion and the first drain portion comprise a metal advanced lateral crystallization region.	"[T]heir direction of crystallization is the same. (page 8, lines 9-10) "advancing the crystallization of the source and drain at the same time as the crystallization of the active layer (channel forming region)." (page 2, lines 15-17.) "The crystal silicon which expands thus from a specific location has a structure close to a monocrystal having good continuous crystallinity." (page 3, lines 23-25). "[T]he crystal grew in the horizontal direction from the region into which nickel was introduced (the region contacting with an oxide film 51) to the region into which no nickel was introduced." (page 14, line 30 – page 15, line 1). "[C]rystal growth in the horizontal direction." (page 18, line 3). "[T]he present invention allows control of the direction of

	crystal growth." (page 18, lines 7-8). "[T]he crystals are grown in the transverse direction with the surface of the substrate" (page 24, lines 2-3).
6. The transistor of claim 5, wherein the second source portion comprises a metal advanced crystallization region.	"[A]dvancing the crystallization of the source and drain" (page 2, line 15). As shown in Fig. 1B, the nickel silicide films 17A and 17B only cover the outer portion of the impurity regions 16A and 16B. "[C]rystals are grown in the vertical direction with the surface of the substrate from the lower side of the semiconductor to the upper side thereof or vice versa." (page 24, lines 3-5).
7. The transistor of claim 5, wherein the second drain portion comprises a metal advanced crystallization region.	"[A]dvancing the crystallization of the source and drain" (page 2, line 15). As shown in Fig. 1B, the nickel silicide films 17A and 17B only cover the outer portion of the impurity regions 16A and 16B. "[C]rystals are grown in the vertical direction with the surface of the substrate from the lower side of the semiconductor to the upper side thereof or vice versa." (page 24, lines 3-5).
8. The transistor of claim 5, wherein the source and drain regions are impurity doped.	[A]n impurity was introduced by a plasma doping method. . . . Impurity regions 16A and 16B were thus formed. (page 7, lines 10-15, Figure 1B).
9. The transistor of claim 5, wherein the channel region, the first source portion and the first drain portion comprise the metal advanced lateral crystallization region,	"advancing the crystallization of the source and drain at the same time as the crystallization of the active layer (channel forming region)." (page 2, lines 15-17). "The crystal silicon which expands thus from a specific location has a structure close to a monocrystal having good continuous crystallinity." (page 3, lines 23-25). "[T]he crystal grew in the horizontal direction from the region into which nickel was introduced (the region contacting with an oxide film 51) to the region into which no nickel was introduced." (page 14, line 30 – page 15, line 1). "[C]rystal growth in the horizontal direction." (page 18, line 3). "[T]he present invention allows control of the direction of crystal growth." (page 18, lines 7-8). "[T]he crystals are grown in the transverse direction with the surface of the substrate" (page 24, lines 2-3).
the second source region comprises a metal	"[A]dvancing the crystallization of the source

advanced crystallization region,	and drain" (page 2, line 15). As shown in Fig. 1B, the nickel silicide films 17A and 17B only cover the outer portion of the impurity regions 16A and 16B. "[C]rystals are grown in the vertical direction with the surface of the substrate from the lower side of the semiconductor to the upper side thereof or vice versa." (page 24, lines 3-5).
and the second drain region comprises a metal advanced crystallization region.	"[A]dvancing the crystallization of the source and drain" (page 2, line 15). As shown in Fig. 1B, the nickel silicide films 17A and 17B only cover the outer portion of the impurity regions 16A and 16B. "[C]rystals are grown in the vertical direction with the surface of the substrate from the lower side of the semiconductor to the upper side thereof or vice versa." (page 24, lines 3-5).
10. A transistor comprising:	The present invention relates to a method of obtaining... (thin film transistor or TFT) (page 1, lines 5-8); The TFT . . .was fabricated through the process described above. (page 7, line 32 – page 8, line 1)
a metal advanced lateral crystallization region	"forming regions containing at least one of nickel,... so that they adhere on part of the impurity regions, and by annealing the whole to crystallize it starting from the region containing nickel" (page 2, lines 8-11). "advancing the crystallization of the source and drain at the same time as the crystallization of the active layer (channel forming region)." (page 2, lines 15-17). "The crystal silicon which expands thus from a specific location has a structure close to a monocrystal having good continuous crystallinity." (page 3, lines 23-25). "[T]he crystal grew in the horizontal direction from the region into which nickel was introduced (the region contacting with an oxide film 51) to the region into which no nickel was introduced." (page 14, line 30 – page 15, line 1). "[C]rystal growth in the horizontal direction." (page 18, line 3). "[T]he present invention allows control of the direction of crystal growth." (page 18, lines 7-8). "[T]he crystals are grown in the transverse direction with the surface of the substrate" (page 24, lines 2-3).

formed on a substrate	substrate . . . 10 (page 6, line 11).
with a semiconductor material	title; "an amorphous silicon film" (page 6, line 12)
and including a channel region; and	"channel forming region (the semiconductor region under the gate) electrode" (page 8, lines 8-9) (Fig. 1)
a plurality of metal advanced crystallization regions formed on sides of the metal advanced lateral crystallization region with a semiconductor material,	"[H]oles were created on the silicon oxide file 13 on the impurity regions to form nickel silicide (or nickel) films 17A and 17B . . . Then annealing was carried out . . to crystallize the impurity regions 16 and other semiconductor regions." (Fig. 1; page 7 lines 16-22).
wherein at least one portion between the metal advanced lateral crystallization region and one of the metal advanced crystallization regions is located outside the channel region.	"[T]he present invention allows substantial elimination of the grain boundary between the source and drain and the active layer... by advancing the crystallization of the source and drain at the same time as crystallization of the active layer (channel forming region)." (page 2, lines 12-17); "According to the present invention,... the region of the crystal silicon is expanded away therefrom as the starting point." (page 3, lines 13-18); "crystal growth advances from both ends of the island semiconductor region and finishes around the middle thereof. Accordingly, no grain boundary was produced in the channel forming region" (page 9, lines 15-19; Fig. 1 and 2(b)).
11. A transistor comprising:	The present invention relates to a method of obtaining... (thin film transistor or TFT) (page 1, lines 5-8); The TFT . . .was fabricated through the process described above. (page 7, line 32 – page 8, line 1)
a channel region;	"channel forming region (the semiconductor region under the gate) electrode" (page 8, lines 8-9) (Fig. 1)
a source region	"the source" (page 8, line 7).
having a source portion adjacent to the channel region; and	"[A] film or the like containing a simple substance of nickel . . .is adhered to the impurity regions . . . and the region of the crystal silicon is expanded away therefrom as the starting point." (page 3, lines 13-18). As shown in Fig. 1B, the nickel silicide films 17A and 17B only cover the outer portion of the impurity regions 16A and 16B. "crystal growth advances from both ends of the island semiconductor region and finishes around the

	middle thereof. Accordingly, no grain boundary was produced in the channel forming region" (page 9, lines 15-19; Fig. 1 and 2(b)). Thus, any "grain boundary" exists in the source portion and defines the first source portion and the second source portion.
a drain region having a drain portion adjacent to the channel region;	"[A] film or the like containing a simple substance of nickel . . .is adhered to the impurity regions . . . and the region of the crystal silicon is expanded away therefrom as the starting point." (page 3, lines 13-18). As shown in Fig. 1B, the nickel silicide films 17A and 17B only cover the outer portion of the impurity regions 16A and 16B. "crystal growth advances from both ends of the island semiconductor region and finishes around the middle thereof. Accordingly, no grain boundary was produced in the channel forming region" (page 9, lines 15-19; Fig. 1 and 2(b)). Thus, any "grain boundary" exists in the drain portion and defines the first drain portion and the second drain portion.
wherein the channel region and at least one of the source portion and the drain portion comprise a metal advanced lateral crystallization region.	"[T]heir direction of crystallization is the same. (page 8, lines 9-10) "advancing the crystallization of the source and drain at the same time as the crystallization of the active layer (channel forming region)." (page 2, lines 15-17.) "The crystal silicon which expands thus from a specific location has a structure close to a monocrystal having good continuous crystallinity." (page 3, lines 23-25). "[T]he crystal grew in the horizontal direction from the region into which nickel was introduced (the region contacting with an oxide film 51) to the region into which no nickel was introduced." (page 14, line 30 – page 15, line 1). "[C]rystal growth in the horizontal direction." (page 18, line 3). "[T]he present invention allows control of the direction of crystal growth." (page 18, lines 7-8). "[T]he crystals are grown in the transverse direction with the surface of the substrate" (page 24, lines 2-3).
12. A transistor comprising:	The present invention relates to a method of obtaining... (thin film transistor or TFT) (page 1, lines 5-8); The TFT . . .was fabricated

	through the process described above. (page 7, line 32 – page 8, line 1)
a metal-induced lateral crystallization region	"forming regions containing at least one of nickel,... so that they adhere on part of the impurity regions, and by annealing the whole to crystallize it starting from the region containing nickel" (page 2, lines 8-11). "advancing the crystallization of the source and drain at the same time as the crystallization of the active layer (channel forming region)." (page 2, lines 15-17). "The crystal silicon which expands thus from a specific location has a structure close to a monocrystal having good continuous crystallinity." (page 3, lines 23-25). "[T]he crystal grew in the horizontal direction from the region into which nickel was introduced (the region contacting with an oxide film 51) to the region into which no nickel was introduced." (page 14, line 30 – page 15, line 1). "[C]rystal growth in the horizontal direction." (page 18, line 3). "[T]he present invention allows control of the direction of crystal growth." (page 18, lines 7-8). "[T]he crystals are grown in the transverse direction with the surface of the substrate" (page 24, lines 2-3).
formed on a substrate	substrate . . . 10 (page 6, line 11).
with a semiconductor material	title; "an amorphous silicon film" (page 6, line 12)
and including a channel region; and	"channel forming region (the semiconductor region under the gate) electrode" (page 8, lines 8-9) (Fig. 1)
a plurality of metal-induced crystallization regions formed on sides of the metal induced lateral crystallization region with a semiconductor material,	"[H]oles were created on the silicon oxide file 13 on the impurity regions to form nickel silicide (or nickel) films 17A and 17B . . . Then annealing was carried out . . to crystallize the impurity regions 16 and other semiconductor regions." (Fig. 1; page 7 lines 16-22).
wherein at least one boundary between the metal induced lateral crystallization region and one of the metal induced crystallization regions is located outside the channel region.	"[T]he present invention allows substantial elimination of the grain boundary between the source and drain and the active layer... by advancing the crystallization of the source and drain at the same time as crystallization of the active layer (channel forming region)." (page 2, lines 12-17); "According to the present invention,... the region of the crystal silicon is

	expanded away therefrom as the starting point." (page 3, lines 13-18); "crystal growth advances from both ends of the island semiconductor region and finishes around the middle thereof. Accordingly, no grain boundary was produced in the channel forming region" (page 9, lines 15-19; Fig. 1 and 2(b)).
13. A transistor comprising:	The present invention relates to a method of obtaining... (thin film transistor or TFT) (page 1, lines 5-8); The TFT . . .was fabricated through the process described above. (page 7, line 32 – page 8, line 1)
a channel region;	"channel forming region (the semiconductor region under the gate) electrode" (page 8, lines 8-9) (Fig. 1)
a source region	"the source" (page 8, line 7).
having a first source portion adjacent to the channel region and a second source portion adjacent to the first source portion; and	"[A] film or the like containing a simple substance of nickel . . .is adhered to the impurity regions . . . and the region of the crystal silicon is expanded away therefrom as the starting point." (page 3, lines 13-18). As shown in Fig. 1B, the nickel silicide films 17A and 17B only cover the outer portion of the impurity regions 16A and 16B. "crystal growth advances from both ends of the island semiconductor region and finishes around the middle thereof. Accordingly, no grain boundary was produced in the channel forming region" (page 9, lines 15-19; Fig. 1 and 2(b)). Thus, any "grain boundary" exists in the source portion and defines the first source portion and the second source portion.
a drain region having a first drain portion adjacent to the channel region and a second drain portion adjacent to the first drain portion;	"[A] film or the like containing a simple substance of nickel . . .is adhered to the impurity regions . . . and the region of the crystal silicon is expanded away therefrom as the starting point." (page 3, lines 13-18). As shown in Fig. 1B, the nickel silicide films 17A and 17B only cover the outer portion of the impurity regions 16A and 16B. "crystal growth advances from both ends of the island semiconductor region and finishes around the middle thereof. Accordingly, no grain boundary was produced in the channel forming region" (page 9, lines 15-19; Fig. 1 and 2(b)). Thus, any "grain boundary" exists in the drain

	portion and defines the first drain portion and the second drain portion.
wherein the channel region and at least one of the first source portion and the first drain portion comprise a metal induced lateral crystallization region.	"[T]heir direction of crystallization is the same. (page 8, lines 9-10) "advancing the crystallization of the source and drain at the same time as the crystallization of the active layer (channel forming region)." (page 2, lines 15-17.) "The crystal silicon which expands thus from a specific location has a structure close to a monocrystal having good continuous crystallinity." (page 3, lines 23-25). "[T]he crystal grew in the horizontal direction from the region into which nickel was introduced (the region contacting with an oxide film 51) to the region into which no nickel was introduced." (page 14, line 30 – page 15, line 1). "[C]rystal growth in the horizontal direction." (page 18, line 3). "[T]he present invention allows control of the direction of crystal growth." (page 18, lines 7-8). "[T]he crystals are grown in the transverse direction with the surface of the substrate" (page 24, lines 2-3).